Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 101- Q1 Date: 23-7-2017

SHOW ALL YOUR WORK. NO CREDITS FOR ANSWERES WITHOUT JUSTIFICATIONS

(1) (22 points) Find the limit if it exists

a) $\lim_{x\to 3^-} \dfrac{x^2-3x}{x^2-6x+9}$

b) $\lim_{x\to 2} \dfrac{\sqrt{x^2+5}-3}{x-2}$

c) $\lim_{x\to 0} \left(3+x^2 e^{\cos\frac{1}{x}}\right)$

d) $\lim_{x\to 0^+} \left(\dfrac{1}{x}-\ln x\right)$

Problem 2: (6 points) Is the function $f(x)=[x]+[-x]$ continuous at $x=2$? If not what is the type of discontinuity? (Show all your work).

Problem 3: (6 points) Use the $\in-\delta$ definition of limit to show that $\lim_{x\to 2}(3-2x)=-1$.

Find values of δ that correspond to $\in=0.06$

Problem 5: (6 points) Consider the function $f(x)=\dfrac{x^2-1}{x^2-3x-4}$.

(a) Find all values of *x* where the function is discontinuous and state the type of each one.

(b) Find all vertical asymptotes of the function.